C. A. NEEDHAM.

Mechanical Musical Instrument.

No. 221,696. Patented Nov. 18, 1879.

Fig 1.

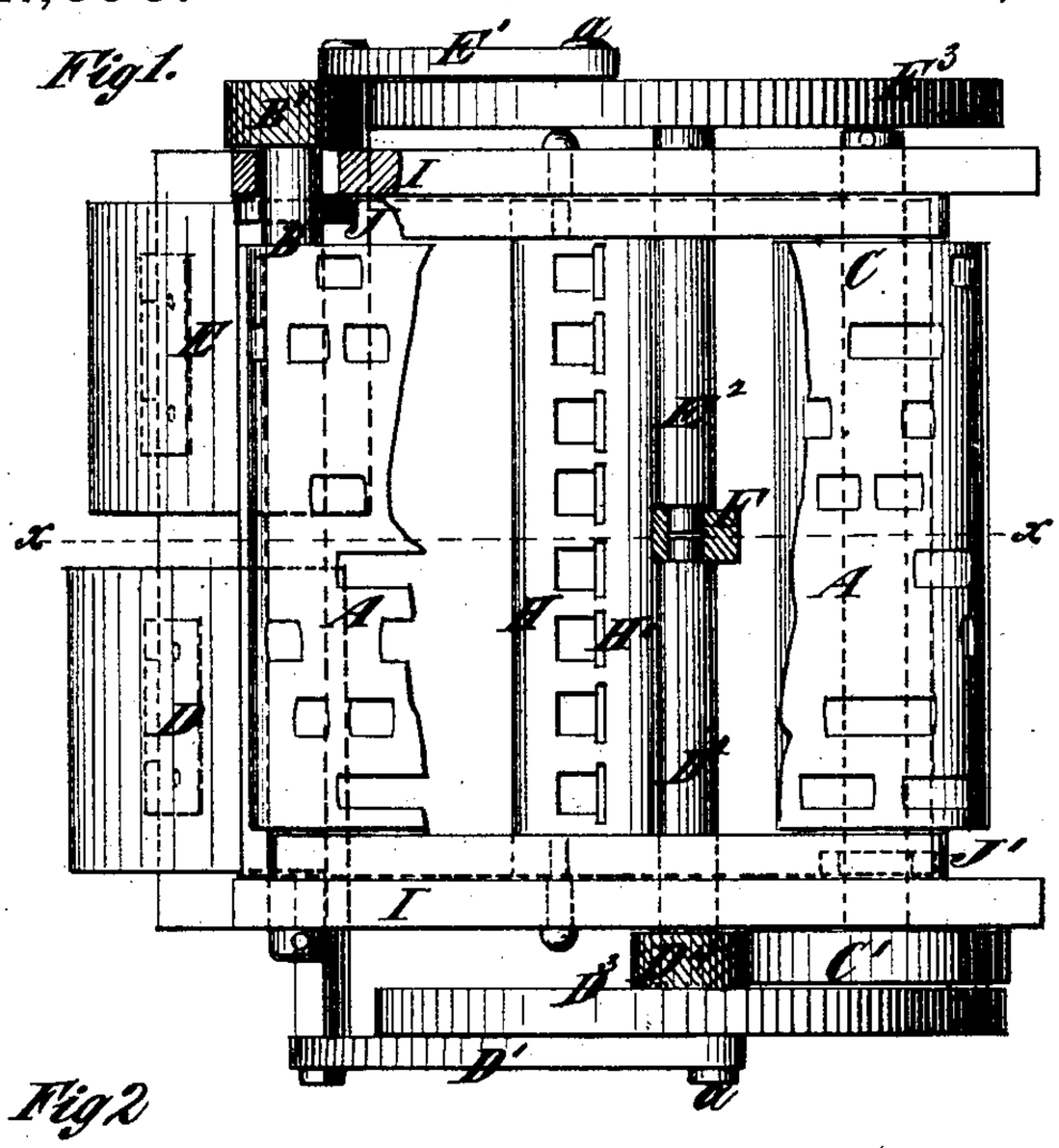


Fig 2

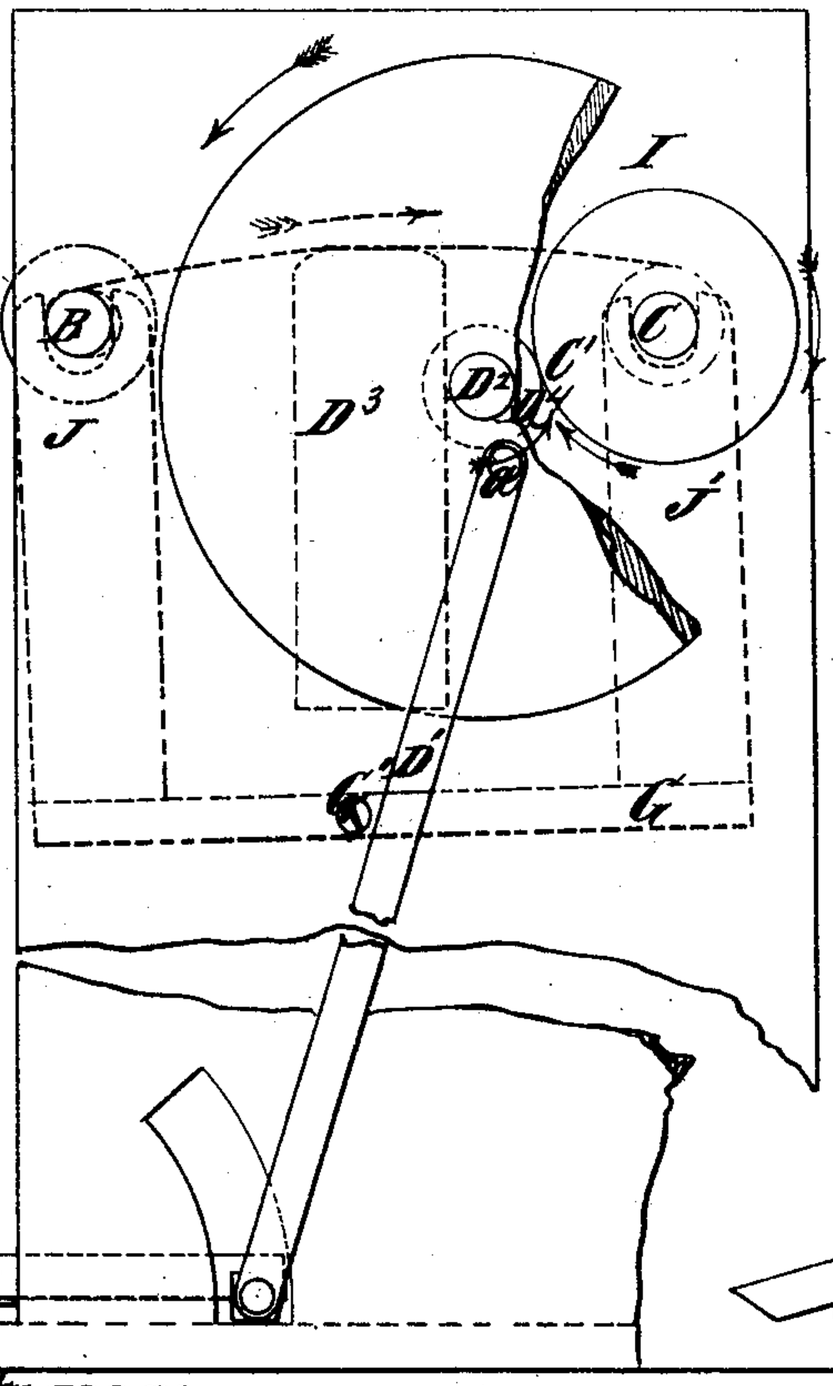
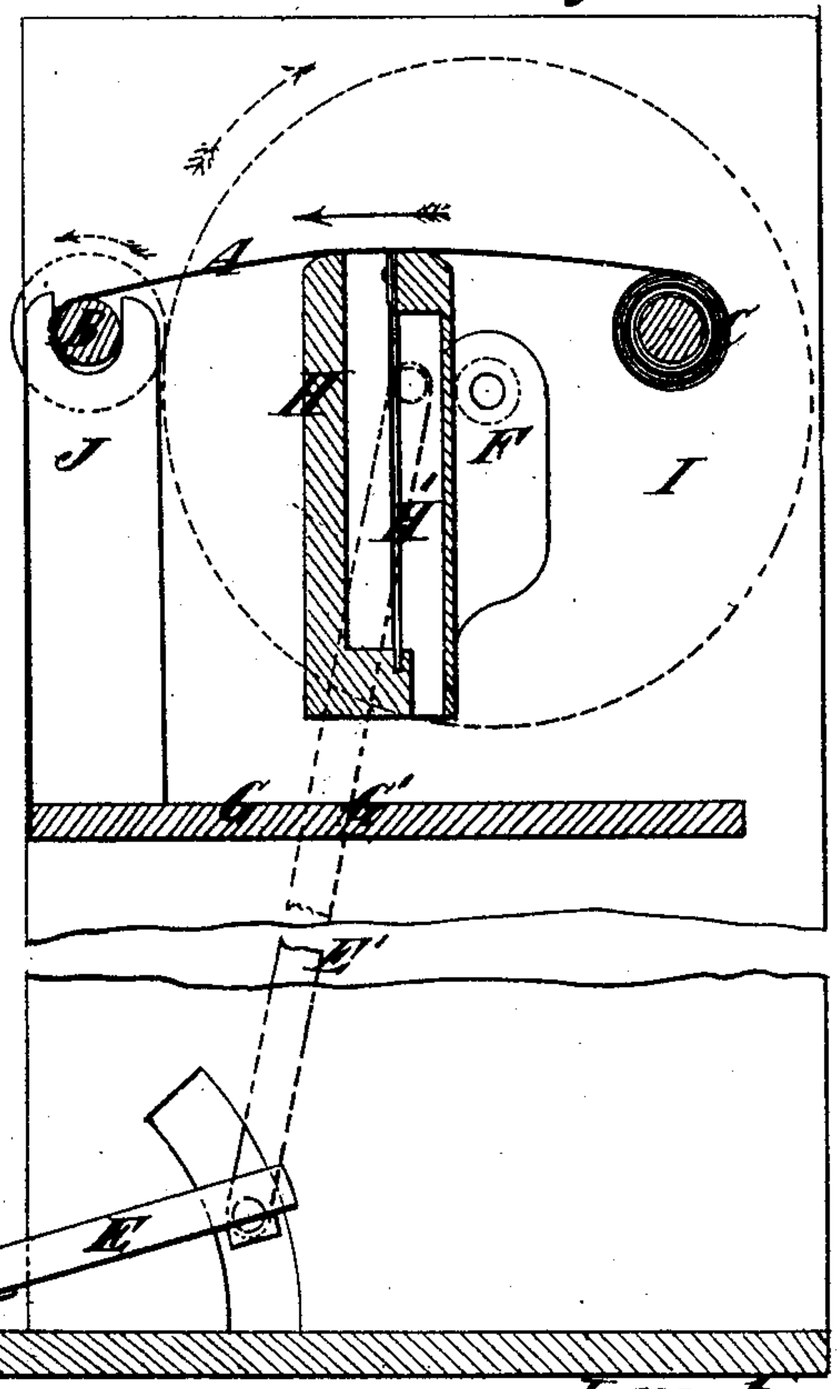


Fig 3.



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UNITED STATES PATENT OFFICE.

CHARLES A. NEEDHAM, OF NEW YORK, N. Y.

IMPROVEMENT IN MECHANICAL MUSICAL INSTRUMENTS.

Specification forming part of Letters Patent No. **221,696,** dated November 18, 1879; application filed August 26, 1879.

To all whom it may concern:

Be it known that I, CHARLES A. NEEDHAM, of the city of New York, in the county and State of New York, have invented certain new and useful Improvements in Mechanical Musical Instruments, of which the following is a specification.

My invention relates to that class of mechanical musical instruments in which the playing is controlled by the passage of a sheet of perforated paper through the instrument. In such instruments the sheet of perforated paper or music-sheet, preparatory to being passed through the instrument, is wound upon a roller, which may be called the "music-roller," and after passing through the instrument it is wound upon another roller, which may be called the "take-up roller." Such instruments are frequently provided with means whereby the driving mechanism may be disengaged from the take-up roller and made to engage with the music-roller for effecting the rewinding of the music-sheet upon the said music-roller.

The object of this invention is to provide means whereby the music-sheet may be rewound or passed backward through the instrument, after being played, by means of an independent motor; and to this end my invention consists in the combination, with a music-sheet, of mechanism whereby the same may be rewound or passed backward through the instrument after being played, and an independent motor for operating said mechanism, the said motor being so connected with said mechanism that it may be readily engaged therewith or disengaged therefrom.

It also consists in the combination, in a mechanical musical instrument, of a music-sheet, mechanism for feeding the same through the instrument, a main motor for actuating said feeding mechanism, mechanism whereby the said music-sheet may be rewound or passed backward through the instrument after being played, a rewinding or returning motor for actuating said rewinding or returning mechanism, whereby I effect the rewinding or backward movement of the music-sheet without the operation of the main motor, and means whereby the feeding mechanism may be disengaged from the main motor, and whereby the rewinding or other mechanism for producing a backward movement of the music-sheet may be made to engage with the rewinding motor simultaneously.

The invention also consists in details and combinations of parts hereinafter to be described.

In the accompanying drawings, Figure 1 represents a plan view of an instrument embodying my invention, the music-sheet being broken away the better to illustrate my invention. Fig. 2 represents a side view of a portion thereof; and Fig. 3, a vertical section of a portion thereof upon the dotted line *x x*, Fig. 1.

Similar letters of reference designate corresponding parts in all the figures.

A designates a perforated strip or music-sheet. B designates a music-roller, upon which the music-sheet is wound preparatory to being played; and C designates a take-up roller, by which the forward movement of the music-sheet is produced. In this example of my invention the music-sheet, when in use, is attached at the ends to these two rollers. Motion is imparted to these rollers by means of two motors, herein referred to as the main and the rewinding or returning motors.

The main motor consists of the treadle D, connected by means of a connecting-rod, D′, with a crank mounted on the end of a shaft, D^2; and the rewinding or returning motor consists of the treadle E, connected by means of a connecting-rod, E′, with a crank mounted on the end of a shaft, E^2, (represented as arranged concentric with the shaft D^2,) the inner ends of both being supported in a central bearing, F. (Represented in section in Fig. 1.) The cranks of these motors, as here represented, consist of wrists *a*, extending from fly-wheels D^3 E^3.

As here represented, motion is transmitted from the shaft E^2 to the music-roller B by means of the wheel E^3 on said shaft, the periphery of which is in frictional contact with a pulley, B′, on said music-roller, and motion is transmitted from the shaft D^2 to the take-up roller C by means of a pulley or pulley-face, D^4, on the said shaft, the periphery of which

is in frictional contact with a pulley, C′, on said take-up roller. In order to increase friction and prevent slipping, certain of these pulleys may be covered with rubber.

If desirable, motors of other kinds may be substituted for the main and rewinding or returning motors here described, and the arrangement of mechanism whereby motion is imparted to the music-roller and take-up roller may be modified in various ways.

The disengagement of the take-up roller from its driving mechanism, and the engagement of the music-roller with its driving mechanism, are preferably effected simultaneously, and to accomplish this the two rollers are shown as so mounted in bearings in side frames, I, that they may be shifted therein toward and away from the axes of the shafts D^2 and E^2, so that they may, respectively, be brought into or out of contact with the pulley D^4 and the wheel E^3, and combined with the said rollers are bearings J J′, whereby the said rollers may be so shifted. These bearings J J′, as here represented, are mounted upon a plate or frame, G, which is pivoted at G′ to the side frames of the instrument, and may be oscillated to and fro to effect the simultaneous shifting of the rollers, one into and the other out of engagement with the device from which it derives motion.

H designates an action-board, over which the music-sheet is fed, and in which are reed-tubes and reeds H′. (Clearly represented in Fig. 3.) The reed-tubes may be supplied with or exhausted of air by means of a bellows, (not here represented,) and which may be operated by the treadle D.

In place of the action-board and reeds, the music-sheet might be employed to actuate mechanical musical devices, organ-pipes, or any other sound-producing devices or motors, such as pneumatic keys employed to effect the operation of music-producing devices.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with a music-sheet, of mechanism whereby the same may be rewound or passed backward through the instrument after being played, a rewinding or returning motor independent of the main motor for operating said mechanism, and means whereby said mechanism may be made to engage with or be disengaged from said motor, substantially as specified.

2. The combination, in a mechanical musical instrument, with a music-sheet, of mechanism for feeding the same through the instrument, a main motor for operating said feeding mechanism, mechanism for rewinding said music-sheet or passing it backward through the instrument after being played, a rewinding or returning motor independent of the main motor for operating said rewinding mechanism, and means for simultaneously effecting the disengagement of the feeding mechanism from the main motor and the engagement of the rewinding mechanism with the rewinding or returning motor, substantially as specified.

3. The combination, with a music-sheet, of a take-up roller, a main motor for operating said take-up roller, a music-roller, a rewinding or returning motor for operating said music-roller, and mechanism whereby the take-up roller may be disengaged from the main motor and the music-roller engaged with the rewinding or returning motor simultaneously, substantially as specified.

4. The combination, with the music-sheet A, the music-roller B, and the take-up roller C, of the two concentric shafts D^2 E^2, through which motion is imparted to the said rollers and the treadles D and E, for operating said shafts, substantially as specified.

5. The combination, with the music-sheet A, the music-roller B, and the take-up roller C, of the shafts D^2 E^2, for operating said rollers, and the oscillating frame G, forming bearings for said rollers, whereby they may be oscillated alternately toward and from said shafts, substantially as specified.

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